DISCUSSION OF THE AMENDMENT

Claims 10 and 13 have each been canceled. Claims 6, 7, 16 and 17 are now pending in the application.

REMARKS

The rejections of Claims 6, 7, 10, 13, 16 and 17 under 35 U.S.C. § 103(a) as unpatentable over U.S. 4,375,418 (Zoleski et al) alone, or additionally in view of U.S. 3,172,892 (LeSuer et al) and EP 0839894 (Katafuchi), are respectfully traversed.

As recited in Claim 6, the present invention is drawn to a method of promoting acid-neutralization in a cylinder oil for engines of ships. As recited in Claim 7, the invention is also a method comprising lubricating a ship engine with a cylinder oil. The method includes adding to the oil an acid-neutralizing promoter which comprises a succinimide component obtainable by reacting diethylene triamine having a resulting carbon/nitrogen weight ratio of 1.14 with a particular succinic acid compound.

Applicants have furnished comparative data in the specification, bolstered with further data from the newly-submitted Katafuchi Declaration in an effort to show unexpected results with regard to the presently-recited carbon/nitrogen weight ratio of 1.14. In Zoleski et al, on the other hand, while the alkenyl succinimide therein may be derived from an amine having from 2 to 12 nitrogen atoms, i.e., x is from 0 to 10 in the formula at column 2, lines 53-63, Zoleski et al discloses that x is preferably 3 or 4 or mixtures thereof (column 4, lines 17-18). When x is 3, the carbon/nitrogen weight ratio is necessarily 1.37; when x is 4, the ratio is necessarily 1.42. Thus, the preferred alkenyl succinimide embodiments of Zoleski et al are outside the terms of the present claims. Zoleski et al do not specifically disclose any polyamines having a carbon/nitrogen weight ratio of 1.14. Nor do the particular working examples of Zoleski et al specify the chemical structure of their alkenyl succinimide beyond disclosing that it is derived from a polyamine. See Table I, footnote (3). In addition, Zoleski et al generally employ less than the minimum 10% by weight amount of present component (a), even if their over based sulfurized calcium phenate could be construed as overlapping the presently-recited over based phenate. The particular working examples of Zoleski et al

employ 4.65% by weight of their over based sulfurized calcium phenate and 1.83% by weight of their over based calcium sulfonate. See Table I, footnotes (4) and (5).

Regarding Applicants' data, the examples and comparative example (as well as the other comparative examples) were subjected to both an acid neutralization capability test and a stability test, as described in the specification at page 15, line 4 through page 16, line 3. The examples produced a substantially larger pressure increase, meaning a higher corrosion, wear-resisting ability, compared to the comparative example. In addition, in the stability test, the stored sample of the examples gave no precipitate, while the stored sample of the comparative example gave some precipitate. The data from Table 1-1 for Example 1 and Example 4, which is now a Comparative Example, with additional data is explained in the previous amendment, together with Comparative Example 5, all from the newly-submitted Katafuchi Declaration, are reproduced below in Table A from the Katafuchi Declaration:

Table A

	Example 1	Example 4 (Comp. Ex. 4)	Comp. Ex. 5
Number-average molecular weight of polybutenyl group	1,000	1,000	1,000
Polyamine (C/N weight ratio)	Diethylenetriamine 1.14	Ethylenediamine 0.86	Diethylene-triamine 1.14
Succinic acid/Polyamine (molar ratio)	1.0	1.0	1.0
Succinimide (wt.%)	0.5	0.5	0.5
Ca sulfonate (TBN 510) (wt.%)	14.0	14.0	4.0
Internal pressure increase after 20 seconds (kg/cm^2)	2.92	2.10	-
Internal pressure increase after 30 seconds (kg/cm^2)	2.92	2.60	0.02 *1
Stability test	O good	O good	-

*1: The internal pressure was also increased after 1000 seconds.

As shown by Table A, the internal pressure increase (kg/cm^2) after 20 seconds and 30 seconds in Example 1 are both 2.92, meaning that an acid neutralization reaction is completed

in 20 seconds. In contrast thereto, the internal pressure increase (kg/cm^2) after 20 seconds and 30 seconds in Example 4 are 2.10 and 2.60, respectively, meaning that an acid neutralization reaction is not completed in 30 seconds. The internal pressure increase after 30 seconds in Comparative Example 5 is 0.02, and it was also increased after 1000 seconds, meaning that an acid neutralization reaction is not completed in 1000 seconds. In other words, the sample of Example 1 has a higher corrosion, wear-resisting ability than Example 4 and Comparative Example 5.

In the present Office Action, the Examiner notes that prior art references are to be considered for all subject matter fairly disclosed either alone or together for what they teach the worker of ordinary skill in the art and thus, Zoleski et al is not limited to specific examples or preferred teachings, and furthermore, to the extent Applicants are relying on comparative data to show unexpected results, the results must be shown to have been unexpected and that they be commensurate in scope with the claims.

In reply, any showing of unexpected results must be commensurate in scope with only so much of the claimed invention that is *prima facie* obvious, which is not necessarily the full scope of any particular claim. As discussed above, while Zoleski et al disclose a value of x of from 0 to 10, Zoleski et al prefers a value of x of 3 or 4. The above-discussed comparative data, on the other hand, demonstrates that results are better when outside the preferred range of x of Zoleski et al. One would clearly understand that a result for a non-preferred embodiment that is better than the result for a preferred embodiment is necessarily unexpected.

The Examiner finds that Examples 1 and 8 of LeSuer et al represents the closest prior art. However, while these examples use diethylene triamine, they are not examples of a cylinder oil; rather, they are examples of succinimides only. In other words, while Zoleski et al incorporates LeSuer et al by reference, nevertheless, the closest prior art **cylinder oil** must

necessarily be one specifically disclosed by Zoleski et al. Moreover, since LeSuer et al also exemplifies using polyamines outside the terms of the present claims, LeSuer et al discloses nothing that detracts from Zoleski et al's disclosed preference of polyamines outside the terms of the present claims.

Nor does Katafuchi remedy the above-discussed deficiencies of Zoleski et al alone or in combination with LeSuer et al. Katafuchi requires a bis-type succinimide compound. Comparative Example 2 therein demonstrates that when a mono-type alkenyl succinimide is used in place of the bis-type alkenyl succinimide of his invention, inferior results are obtained with regard to the stability test described at page 7 therein. See Table 1 therein.

Data for the present invention and Katafuchi are shown in the following table:

	Example 1	Katafuchi Example 1	Katafuchi Comp. Ex. 2
Number-average molecular weight of polybutenyl group	1,000	1,000	1,000
Polyamine (C/N weight ratio)	Diethylenetriamine 1.14	-	-
Succinic acid/Polyamine (molar ratio)	1.0	-	-
Succinimide (wt.%)	0.5	Bis-type 0.5	Mono-type 0.5
Ca sulfonate (TBN 510) (wt.%)	14.0	14	14
Internal pressure increase after 30 seconds (kg/cm^2)	2.92	2.2	0
TBN of cylinder oil (mg-KOH/g)	71.4	71.4	71.4
Stability test	○ good	○ good	× poor

The content of succinimide and overbased calcium sulfonate, and TBN of the cylinder oil are the same in the three examples. However, Example 1 of the present invention has a higher corrosion, wear-resisting ability than Example 1 and Comparative Example 2 of Katafuchi.

In addition, it is noted that the nitrogen content of the bis-type alkenyl succinimide of Example 1 of Katafuchi is 0.95 wt%, that of Comparative Example 2 of Katafuchi is 2.02 wt%, and that of Example 1 of the present invention is 3.6 wt%.

Thus, if one skilled in the art were to combine Katafuchi with Zoleski et al, one skilled in the art would choose the bis-type succinimide compound of Katafuchi. The Examiner cannot simply choose from Katafuchi those disclosures that support the rejection, but ignore teachings against it.

In the present Office Action, the Examiner again finds that the above argument that one skilled in the art would choose the bis-type alkenyl succinimide compound of Katafuchi "as speculative and ignores the teachings of Zoleski et al. Further, Applicants' argument, if accepted, would improperly remove the teachings of Zoleski et al from the available prior art."

In reply, and as pointed out during the previous response, the above argument, if accepted, would **not** remove Zoleski et al's prior art teachings because the **combination** of Zoleski et al with Katafuchi is **not** in the prior art. While Applicants submit that one skilled in the art would not combine Zoleski et al and Katafuchi, nevertheless, if this prior art were combined, the result would be the use of Katafuchi's bis-type alkenyl succinimide compound, demonstrated by Katafuchi to be better than a corresponding mono-type alkenyl succinimide. Such a result does **not** remove Zoleski et al's teachings from the prior art.

The Examiner has not responded to this argument.

The Examiner then adds that Applicants' argument in essence is an argument that the claims are not obvious over Katafuchi alone and that the present claims do not exclude the bis-type alkenyl succinimide compound of Katafuchi.

In reply, while Applicants agree that the claims are not obvious over Katafuchi alone, they are also not obvious over the combination applied by the Examiner. Nor is it relevant

that the present claims do not exclude the presence of the bis-type alkenyl succinimide compound of Katafuchi. The present claims require a mono-type alkenyl succinimide, which Katafuchi teaches away from.

In addition, it is only with the present disclosure as a guide that one skilled in the art would combine Zoleski et al and Katafuchi. Zoleski et al's amount and base number of their overbased component is with regard to a composition based on a mono-type alkenyl succinimide. In Katafuchi, the corresponding amount and base number is with regard to a composition based on a bis-type alkenyl succinimide. The Examiner has no basis for, in effect, ignoring the difference in succinimide type in finding that it would have been obvious to change Zoleski et al's amount and base number of their overbased component to that of Katafuchi.

For all the above reasons, it is respectfully requested that the rejections over prior art be withdrawn.

The rejection of Claims 10 and 13 under 35 U.S.C. § 112, second paragraph, is respectfully traversed. Indeed, the rejection is now moot in view of the above-discussed amendment. Accordingly, it is respectfully requested that this rejection be withdrawn.

All of the presently pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

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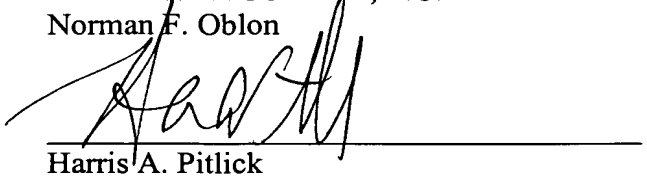
Norman F. Oblon



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